

### Abstract

This invention pertains to a hollow core photonic band gap chalcogenide optical glass fiber and to a fabrication method for making the fiber. The fiber, which is 80-1000 microns in outside diameter, is characterized by a solid glass circumferential region and a structured region disposed centrally within the solid region, the structured region includes a hollow core of 1 micron to several hundreds of microns in diameter surrounded by a plurality of parallel hollow capillaries extending parallel to the core, the core being centrally and longitudinally located within the fiber. Ratio of open space to glass in the structured region is 30-99 %. The fabrication method includes the steps of providing a mold, placing chalcogenide micro-tubes around the mold, stacking chalcogenide micro-canes around the stacked micro-tubes, fusing the micro-tubes and the micro-canes to form a preform, removing the mold and drawing the preform to obtain the fiber. In an alternative fabrication method, the fiber is made by extruding flowing chalcogenide glass through suitably made plate to form a preform and then drawing the preform to form the fiber.